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G. F. ERAMBERT SEED ORCHARD

WOOD · WATER · FORAGE · WILDLIFE · RECREATION

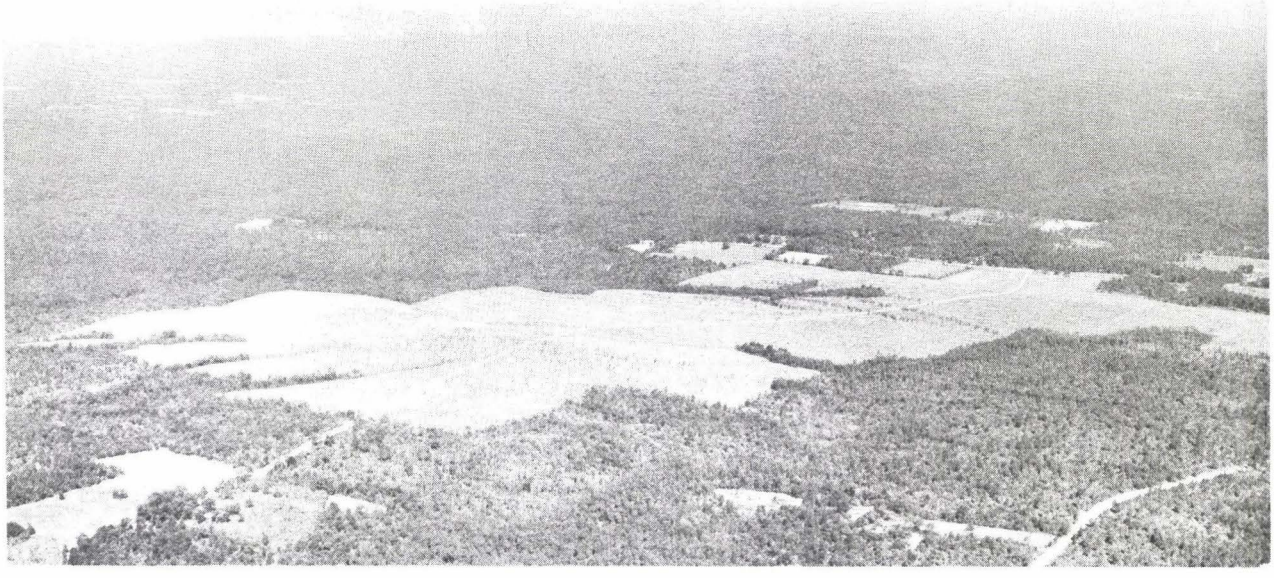
FOREST SERVICE U S DEPARTMENT OF AGRICULTURE

INTRODUCTION

The G. F. Erambert Seed Orchard is located on the Black Creek Ranger District, DeSoto National Forest, Perry County, Mississippi. It is on Mississippi Highway No. 29, 14 miles south of New Augusta.

The seed orchard contains 435 acres, excluding the isolation areas. It will supply genetically superior pine seed for the National Forests in Alabama, Florida, and Mississippi--which have a total area of 2,849,612 acres.

There are five southern yellow pine species, represented by 50 superior trees, from each source. The species and sources are shown in the following tabulation:



ESTABLISHMENT SCHEDULE G. F. ERAMBERT SEED ORCHARD

	Living Grafts by Year of Establishment					Total Grafts in Orchard	Plantable Sites	Percent Planted	Total Acres
	1963-66	1967	1968	1969	1970				
Longleaf So. Ala.			13		131	144	657	22	8.3
Longleaf No. Ala.			19	3	605	627	2,890	22	30.5
Longleaf Miss.	23	285	221	40	400	970	3,570	27	42.1
Longleaf Fla.		260	107	119	447	933	3,793	25	41.2
Loblolly Ala.	1,890	1,900	1,161	421	301	5,675	6,088	93	77.4
Loblolly So. Miss.	1,515	1,446	412	311	207	3,894	4,124	94	49.8
Loblolly No. Miss.		278	168	41	43	530	580	91	6.0
Slash Ala.	418	21	31	14	10	494	569	87	6.2
Slash Miss.	1,726	85	173	167	35	2,187	2,361	93	25.6
Slash Fla.	1,974	742	697	521	495	4,431	6,252	71	69.2
Slash Fla. Hi Gum Yield		680	128	222	41	1,071	1,218	88	12.6
Sand Pine Fla.	76	12	356	64	628	1,136	4,935	23	54.2
Shortleaf Miss.	1	553	188	196	29	967	1,188	81	13.2
	7,623	6,262	3,674	2,119	3,372	23,059	38,225	60	436.3

There are 395 net acres available in the orchard for the establishment of clones. There are spaces for 38,225 grafted ramets.

Each geographic source is arranged by blocks with full sized block containing 10 rows of 27 ramets, or 270 ramets. The ramets are spaced 15' apart within a row, and the rows are 30' apart.

The same species from different sources are separated in the orchard by a distance of 400' or more to minimize cross pollination.

There is a special source of high gum yielding slash pine being grown for scion production as part of a cooperative project between the Southeast Station and Naval Stores producers. This source is located in South Georgia and North Florida and is represented by 100 superior trees. Each is a high gum producing tree, as indicated by tests made during selection by the Naval Stores and Timber Productive Laboratory at Olustee, Florida.

These grafted ramets will be used for a scion bank. Scions will be collected and returned to the cooperators who provided the original superior trees.

Clearing of the orchard site began in 1961. The selection of the superior trees began the same year.

Grafts are made on the same species of root-stock as the scion material. The root-stock is from seed obtained from the same source as the geographic origin of the scion material.

Grafting for the orchard got under way in February, 1963. With the exception of longleaf pine and sand pine, all grafting has been done on potted root-stock in a shaded shed. Longleaf pine and sand pine is grafted to root-stock planted in place in the orchard. The number of ramets established by years and species are shown in the tabulation.

The first cones appeared on South Mississippi loblolly in 1967. The first cones were collected in 1969 from the same source.

Seed Collected from Loblolly Pine

Source	Year	Number of Clones	Seed Yield Lb.	Oz.
So. Miss. Loblolly	1969	10	3	2
	1970	30	7	12
Ala. Loblolly	1970	33	3	4

The number of clones producing cones is expected to increase this year to about 50. Cone production is expected to increase

But the extent is not known. Conelet counts made in 1970 showed that the number of cones quadrupled. Two growing seasons are required for the cones of all orchard species to mature.

INSECTS AND DISEASES

Many insects of only minor economic importance or impractical to control in a general forest area can become a major problem to a seed orchard manager. A case in point is the cone worm (Dioryctria spp.) which has been a serious problem in portions of the loblolly and slash pine. Presently the infected trees are being sprayed with Guthion three times a year during the spring and summer months.

The Nantucket Pine Tip Moth (Rhyacionia frustrana)(Comst.) has been a problem in the loblolly, shortleaf, and sand pine. This pest is being kept under control by spraying with Cygon every 42 days during the months of February through September.

Fortunately we have had no serious problems with the bark beetles.

Brownspot Needle Rust (Scirrhia acicola) is a disease of longleaf pine during the period it is in the grass stage. In a general forest area this disease is kept under control by prescribed burning. However, in the seed orchard the rust is kept under control by spraying the longleaf pine seedlings in the grass

stage with a Bordeaux mixture three times a year--May, June, and November.

One of the most serious diseases found in loblolly and slash pine is Fusiform Rust (Cronartium fusiforme). In our orchard it is most prevalent in Florida slash pine. Four clones have been removed because of excessive rust infection. This involved the removal of 397 ramets.

ORCHARD MANAGEMENT PROBLEMS

1. SOILS AND GRASS MANAGEMENT

The seed orchard is located in the Coastal Plain Province of the Southeastern United States. The soils consist of white clay and red sand containing gravel, principally of the Orangeburg and Ruston Series. The orchard terrain is generally rolling with many areas that are rather steep and the soil is very erodible. Therefore, a heavy sod cover is needed to keep erosion at a very minimum. Due to its low natural fertility, a regular application of fertilizer is desirable. There are also many small gullies, pot holes and stump holes that must be repaired or filled, not only to reduce erosion but to facilitate the movement of equipment through the orchard.

Since the original seeding and fertilizer there has not been sufficient funds to carry out a good fertilization program.

The orchard is mowed two times each year. The second mowing is at right angles to the first mowing. The job is almost a continuous one since it takes 40 to 50 days to cover the area. This amounts to mowing 900 acres a year. Portions of the orchard, particularly the open buffer zones, have been mowed by contract. Local farmers cut these areas for hay. However, the quality of the grass does not make it too attractive for this use.

2. ISOLATION ZONE

The uncleared isolation zone on the west, south, and east sides of the orchard contain scattered pines producing pollen. District timber sales for sawtimber and pulpwood have been made to remove these trees. There is a considerable amount of pine reproduction from seedlings to sapling-size trees that should be removed. Present plans call for removing these trees and other materials with a shear blade and rake. This material will be pushed into windrows and the cleared area will be disked to keep pine reproduction down. This area will also serve as a firebreak.

3. FIRE PROTECTION

In late October and November each year a 50-foot fire line is disked along the northwest, north, and northeast sides of the orchard. In addition, 30-foot fire lines are disked on each side of the roads and one across the north side of the clone locations. Three additional lines are disked between the rows and run east and west across the orchard to break it up

into blocks. The location of these lines is determined and limited by the topography of the area.

The fire lines occupying 60.76 acres have a total length of 8.5 miles.

The orchard is given a Class VI valuation in the District fire plan and is protected accordingly. On Class III and higher fire days a standby crew of two men is on duty on Saturdays, Sundays, and holidays.

The Black Creek Ranger District maintains a 100' fire line through the uncleared portion of the isolation zone of the orchard.

4. INCOMPATIBILITY

For reasons yet unknown there are some clones that seem to be rejected when grafted to the root stock. It is possible that some characteristic of the clone causes the rejection. On the other hand, there may be instances where the root stock is responsible for the rejection. To date six clones have been removed from the orchard because of incompatibility. This required the removal of 270 ramets.

Overall, 10 clones have been removed from the seed orchard due to either incompatibility or disease, which required the removal of 667 ramets.

5. CONE COLLECTION

Collecting the cone crop is potentially one of the major problems that will have to be resolved before the orchard gets into full production. At the moment we see no problem collecting the slash and longleaf pine cones. The tree shaker presently in use does an excellent job of dropping the cones. In the event of a bumper crop time may be a factor. All the cones will have to be collected before they open up. Presently, cones collected from loblolly and shortleaf pine have to be collected by hand. This is a very time consuming job, and time becomes critical since there are 123 acres of loblolly and shortleaf in the seed orchard. It is going to require the resources of many minds to come up with a practical and economical method of collecting the cones or seed.

6. WILDLIFE

Clearing the 430 acres for the seed orchard had a big impact on the wildlife habitat of the area. The area has become an ideal place to produce quail. A great many coveys of quail are raised in the seed orchard each year. Unfortunately most of them move out before hunting season. This is no doubt due to the mowing that is done in the orchard.

Deer are numerous in and adjacent to the seed orchard. Some damage has been done to the trees in the orchard, with 12-15 trees having been killed by the deer.

With the prevalence of deer and quail around the seed orchard there was some concern of damage to the trees by the hunters. However, due to their cooperation, this problem has not materialized.

Birds have probably done the most damage by breaking the terminal growth of the trees. Foxes, gophers (land turtles) and armadillos have caused some trouble. They like to dig holes in the soft ground around the trees. Some ramets have been lost due to their activity.

This year the first wild turkey nests were found inside the orchard. Two nests were found which had a total of 22 eggs. All of the eggs hatched in July and the broods disappeared into the woods.

7. HURRICANE CAMILLE

In August 1969, Hurricane Camille blew over some 4,500 ramets. Metal posts were used to straighten up the worst ones, which involved some 2,500 ramets. Over 125 trees have died as a result of the storm and some further losses can be expected.

LAYOUT OF G.F. ERAMBERT SEED ORCHARD